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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,224	03/31/2004	Maksim Kuzmenka	2004 P 50134 US	7189
25962	7590	12/16/2004	EXAMINER	
SLATER & MATSIL, L.L.P. 17950 PRESTON RD, SUITE 1000 DALLAS, TX 75252-5793			OLIVA, CARMELO B	
			ART UNIT	PAPER NUMBER
			2831	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/815,224

Applicant(s)

KUZMENKA, MAKSIM

Examiner

Carmelo Oliva

Art Unit

2831

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-14 and 20 is/are rejected.
- 7) ☒ Claim(s) 5-9 and 15-19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 4 and 14 recites the limitation "the second dielectric layer" in line 2. There is insufficient antecedent basis for this limitation in the claim. The examiner suggests changing the limitation to "the second insulating layer".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 10-14 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US 6,252,298).

Regarding claims 1 and 11, Lee et al. discloses an apparatus, comprising:

an integrated circuit 31;

a circuit board 28 having a first surface for attaching the integrated circuit and a second surface opposite to first surface;

the recesses provided in the second surface for receiving at least portions of solder balls for electrically and mechanically connecting the circuit board to the support;

solder pads 25 formed within the recesses; and

solder balls 35 at least partially received in the recesses and applied to the solder pads.

Regarding claims 2 and 12, wherein a bond pad 23 is provided on the circuit board and wherein the circuit board comprises conductive structures 33 connecting the bond pad to at least one of the solder pads.

Regarding claim 3 and 13, wherein the circuit board comprises a first insulating layer 28, a second insulating layer 57 and a conductive pattern 26 between the first and the second insulating layer.

Regarding claims 4 and 14, wherein the recesses extend through the second dielectric layer and wherein a portion of the conductive pattern 26 forms the solder pad of at least one of the recesses.

Regarding claims 10 and 20, wherein solder balls 35 are received in the recesses, wherein the circuit board inherently comprises conductive structures for connecting at least some of the solder balls to a signal contact pad on the integrated circuit and for connecting at least another of the solder balls to a ground or power supply contact pad on the integrated circuit in order for operation of the integrated circuit.

Allowable Subject Matter

7. Claims 5-9 and 15-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Claims 5-7,9,15-17 and 19 are allowable because the prior art alone or in combination does not teach or fairly suggest a circuit board having recesses provided in the second surface with solder pads formed in the recesses, wherein there are conductive patterns formed on the second surface of the circuit board, taken in combination with the other claimed features.

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Claims 8 and 18 are allowable because the prior art alone or in combination does not teach or fairly suggest a circuit board comprising a plurality of insulating layers with a plurality of conductive patterns arranged in different levels, wherein a first conductive pattern extends to a first recess and a second conductive pattern on a second level extends to a second recess, taken in combination with the other claimed features.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,084,300; US 6,246,117; US 5,677,566; US 6,469,393; and US 6,552,427 all teach circuit board having recesses with solder pads and solder balls therein.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carmelo Oliva whose telephone number is (571)272-1982. The examiner can normally be reached flexible hours on Monday through Friday with every other Wednesday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard, can be reached at (571)272-2800 ext. 31. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


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